S/076/62/036/007/010/010
B101/B138

AUTHORS: Tumanov, V. I., Funke, V. F., and Belen'kaya, L. I.

TITLE: Wettability of aluminum oxide and of carbides by metals of the iron group

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 7, 1962, 1574 - 1577

TEXT: With the use of a slightly modified apparatus by V. N. Yeremenko, Yu. V. Naydich (Ukr. khim. zh., 23, 573, 1957), the surface tension σ, angle of contact θ, and the work of adhesion W_a were determined for the wetting of Al_2O_3 with Ni or Co, and with Ni-Mo or Co-W alloys, and the angle of contact was measured for the wetting of carbides of the system TiC - WC with Ni. Measurements were made at 10^{-5} mm Hg, 1500°C. Results: (1) Addition of Mo or W (up to 10 atom%) increases the wettability of Al_2O_3 with Ni or Co. The first 2 atom% of Mo or W addition show the strongest effect: σ rises from 1225 to 1500 erg/cm^2 with Ni + 2 atom% of Mo, and from 1560 to 1750 erg/cm^2 with Co + 2 atom% of W. (2) The fact

35032
S/122/62/000/003/006/007
D262/D302

18.1152

AUTHORS: Funke, V.F., Candidate of Technical Sciences, Lider, V.Ya., and Panov, V.S. Engineers

TITLE: Effect of tantalum on physical, mechanical and cutting properties of tungsten-cobalt carbide alloys

PERIODICAL: Vestnik mashinostroyeniya, no. 3, 1962, 79 - 82

TEXT: Experiments conducted to establish the effect of small quantities of tantalum and titanium (up to 3 atomic percent), on WC-Co alloys containing 8 % Co, are described. The alloying elements were introduced in the form of single-phase solid solutions TaC-WC and TiC-WC. The alloys obtained had the same grain size of the WC phase for all contents of the alloying element. The specimens were subjected to the following tests and the results were recorded in form of graphs and analyzed. 1) Bending (machine P-5 (R-5), at 20°C, distance between supports 30 mm); addition of Ta had practically no effect on the bending resistance; addition of Ti lowered the resistance; 2) Impact (pendulum hammer, 50 kg/cm, at 20°C, distance bet-

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S/122/62/000/008/003/004
D262/D308

AUTHORS: Yudkovskiy, S.I., Eykhmans, E.F., Guseva, A.N., Engineers, Funke, V.F., Romanov, K. F., and Smirnov, F.P., Candidates of Technical Sciences

TITLE: Alloys on the TiB_2 basis for cutting tools

PERIODICAL: Vestnik mashinostroyeniya, 42 no. 8, 1962, 44 - 47

TEXT: The authors describe a series of experiments conducted in order to establish the physical, mechanical and cutting properties of TiB_2 alloys. Specimens of 15 alloys containing various percentages of TiB_2 and bounding metals (Fe, Co, Ni) were tested for bending, hardness, and coefficient of friction. Their cutting properties under various working conditions were also investigated and the results of the experiments recorded in form of tables and graphs, and analyzed. TiB_2 alloys (obtained by powder pressing and baking process) possess many advantages

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S/122/62/000/006/003/004
D262/D308

Alloys on the TiB_2 basis ...

over the existing cutting materials (greater hardness, better scale-resistance, absence of adhesion to worked materials, lower coefficient of friction) but their strength is comparatively low. There are 5 figures and 5 tables.

Card 2/2

ACCESSION NR: AT4030800 S/0000/63/000/000/0141/0151

AUTHOR: Tumanov, V. I., Funke, V. F., Belen'kaya, L. I. Usol'tseva, L. P.

TITLE: Effect of alloying on surface tension of the iron group metals and the wettability of aluminum oxide

SOURCE: AN UkrSSR. Institut metallokeramiki i spetsial'ny*kh splavov. Poverkhnostny* ye yavleniya v rasplavakh i protsessakh poroshkovoy metallurgii (Surface phenomena in liquid metals and processes in powder metallurgy). Kiev, Izd-vo AN UkrSSR, 1963, 141-151

TOPIC TAGS: cobalt alloy, nickel alloy, liquid phase surface tension, alloy surface tension, aluminum oxide, aluminum oxide wettability, cobalt copper alloy, nickel copper alloy

ABSTRACT: The effects of alloying Co and Ni with Cu, Mo, W or Ti (0.5, 1.5 and 20 at. %), as well as carbides of the latter three (5 at. %), on the surface tension of the liquid phases and the wetting of Al_2O_3 were studied on alloy samples (h = 5-6 mm, ∅ = 12 mm)

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ACCESSION NR: AT4030800

and Al_2O_3 substrates (h = 4 mm, ϕ = 20 mm, porosity up to 0.2%). Tests were carried out in a vacuum (5 x 10^{-5} mm Hg) at about 1500C (1400C for Cu-containing alloys). The contact angle θ was determined experimentally, using the droplet-at-rest method (accuracy 1-2%). Surface tension σ_j, interphase tension σ_{si} and work of adhesion W_A were calculated. As shown in Fig. 1. of the Enclosure, addition of up to 1.0 at.% alloying elements, especially Cu, lowered θ, but further additions had little effect. Small amounts of alloying elements (0.5-1 at.%), except for Ti, also lowered σ_j (see Figs. 2 and 3 in the Enclosure). Alloying with 5 at.% tungsten carbide lowered θ and σ_j slightly in both Ni and Co; molybdenum carbide had no effect on these parameters in Ni and little effect in Co. Only titanium carbide lowered θ significantly in Ni (from 120 to 62°) and Co (from 120 to 90°), while simultaneously increasing the surface tension. X-ray diffraction patterns of the contact areas between the drop and the substrate show that reactions take place between the liquid metal and the substrate, resulting in formation of a transition layer containing $CoAl_2O_4$ and $NiAl_2O_4$ with a spinel structure. In the case of Ni alloyed with titanium carbide, the transition zone also contained TiC, TiO_2 and NiAl. The authors demonstrate relationships between θ, σ_j, σ_{si} and W_A, on

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ACCESSION NR: AT4030800

the one hand, and the atomic diameter and thermal stability of the alloying component oxides, on the other. The lowest Θ (62°) and maximal W_A (3600 orgs/cm^2) were found in Co + 5 at.% TiC. "The X-ray structural analysis was carried out by Eng. N. S. Urazaliyev." Orig. art. has: 5 tables and 6 graphs.

ASSOCIATION: Vsesoyuzn*y nauchno-issledovatel'skiy institut tverdy*kh splavov, Moscow (All-Union Scientific Research Institute for Solid Alloys)

SUBMITTED: 23Nov63 ENCL: 03

SUB CODE: MM NO REF SOV: 005 OTHER: 006

Card 3/6

ACCESSION NR: AT4030800

ENCLOSURE: 01

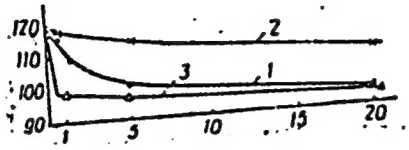

Fig. 1. Contact wetting angle (0) for Ni, Co and their alloys on an Al_2O_3 substrate, alloyed with W (1), Mo (2) and Cu (3). Ordinate = 0 in degrees; abscissa = at. % alloying element.

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ACCESSION NR: AT4030800

ENCLOSURE: 02

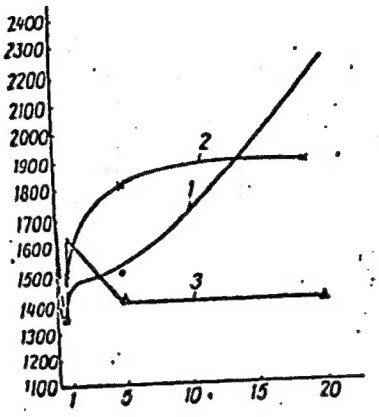

Fig. 2. Surface tension of Ni and its alloys (Al_2O_3) substrate), alloyed with W (1), Mo (2) and Cu (3). Ordinate = σ in ergs/cm^2; abscissa = at. % alloying element.

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ACCESSION NR: AT4030800

ENCLOSURE: 03

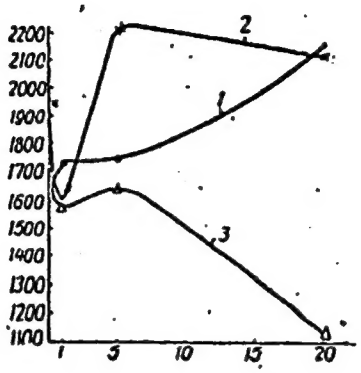

Fig. 3. Surface tension of Co and its alloys (Al_2O_3 substrate), alloyed with W (1), Mo (2), Cu (3), 0.5 at.% Ti (x). Ordinate and abscissa as in Fig. 2.

Card 6/6

FUNKE, V.F.; YUDKOVSKIY, S.I.

Preparing zirconium boride. Porosh. met. 3 no.4:49-53 Jl-Ag '63.
(MIRA 16:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov.

(Zirconium boride)

TUMANOV, V.I.; FUNKE, V.F.; PAVLOVA, Z.I.; NOVIKOVA, T.A.; BYSTROVA, K.A.

Effect of the composition and structure of alloys in the system WC - Co and TiC - WC - Co on the strength limit during compression. Fiz. met. i metalloved. 15 no.2:285-289 F '63. (MIRA 16:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov.

(Tungsten-cobalt alloys--Metallography)
(Titanium-tungsten-cobalt alloys--Metallography)
(Deformations(Mechanics))

Funke, V. F.

V. F. Funke, VI. Pshenichnyy. Study of conditions of obtaining TiC, ZrC, and VC from oxides.

Title: Seminar on refractory metals, compounds, and alloys (Kiev, April 1963).

Source: Atomnaya energiya, v. 15, no. 3, 1963, 266-267

L 9953-65 EWT(m)/EPF(n)-2/EPR/T/EWP(b) Pad/Ps-4/Pu-4 ASD(m)-3 JD/WW/HW/
HLK/WH/JG/AT
ACCESSION NR: AT4046826 S/0000/64/000/000/0108/0113

AUTHOR: Funko, V.F., Yudkovskiy, S.I.

TITLE: Reaction of transition metal borides with metals of the iron group

SOURCE: AN SSSR. Nauchny*y sovet po probleme zharoprochny*kh splavov. Issledovaniya staley i splavov (Studies on steels and alloys). Moscow Izd-vo, Nauka, 1964, 108-113

TOPIC TAGS: titanium boride, zirconium boride, molybdenum boride, iron alloy, nickel alloy, cobalt alloy, alloy strength, alloy hardness

ABSTRACT: There are no publications on the structure and properties of the alloys of titanium boride, zirconium boride and molybdenum boride with iron, although the phase diagrams and properties of the pure compounds have been studied. The present authors investigated the reaction of TiB_2, ZrB_2 and Mo_2B_5 with the iron group metals, as well as some properties of these alloys at room and higher temperatures. Powders were prepared of these alloys and subjected to heat treatment, after which X-ray, metallographic, microhardness and melting temperature studies were performed. Even though there are differences in the electron structure and crystal lattices, the borides of Ti, Zr and Mo react with iron group metals to about the same extent up to the melting point

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ACCESSION NR: AT4046826

0

of the alloys [1250-1300C for TiB_2 + (10-70) at. % Fe, 1230-1270C for ZrB_2 (+30-90) at. % Fe, and Mo_2B_5 + 1120=1170 for (10 to 50) at. % Fe]. The microhardness changes from 2000 kg/mm^2 for ZrB_2 and 2300 kg/mm^2 for Mo_2B_5 to 3700 kg/mm^2 for TiB_2. An increase in the boride content leads to an increase in alloy hardness. Increasing the temperature of heat treatment did not change the rate of reaction of the borides with the iron group elements. The results of tests on the alloys showed that the bending strength and hardness are connected with the FeB (Ni_3B, Co_3B) lattice in the alloy. The hardness of the boride alloys decreased somewhat during heating. It was also found that the alloy strength dropped from TiB_2 to ZrB_2 to Mo_2B_5, and also from iron to nickel or cobalt. The hardness of each boride increased in the order Fe, Ni, Co. Orig. art. has: 3 figures and 3 tables.

ASSOCIATION: none

SUBMITTED: 16Jun64 ENCL: 00 SUB CODE: MM

NO REF SOV: 003 OTHER: 001

Card 2/2

L 18077-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD/HW/JG

ACCESSION NR: AP3004600 S/0126/63/016/001/0113/0116

61
60

AUTHORS: Baskin, M. L.; Tumanov, V. I.; Funko, V. F.

TITLE: Modulus of elasticity for alloys: tungsten carbide-cobalt

SOURCE: Fizika metallov i metallovedeniye, v. 16, no. 1, 1963, 113-116

TOPIC TAGS: tungsten carbide-cobalt, alloy, modulus of elasticity

ABSTRACT: An attempt is made to determine the relation of WC-Co elastic properties to their composition and structure. A formula is offered which expresses the relation of Young's modulus E to the Co content. Three structural variants are discussed, and the formulas for E in each variant are offered. 1) The phases are distributed in layers parallel to the main sample axis;

$$E_a = E_2 + (E_1 - E_2)c_1,$$

2) The phases are distributed in layers perpendicular to the axis;

$$E_6 = E_2 : [1 - c_1(1 - E_2 : E_1)].$$

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ACCESSION NR: AP3004600

3) The matrix distribution of phases: a) cobalt matrix with disseminated WC grains

$$E_3 = E_2 : [1 - c_1(E_1 - E_2) : E_n],$$

$$E_n = E_2 + (E_1 - E_2) \cdot c_1^{1/3}.$$

b) carbide matrix with disseminated Co grains;

$$E_4 = E_1 : [1 + c_2(E_1 - E_2) : E_n'],$$

$$E_n' = E_1 - (E_1 - E_2) c_2^{1/3}.$$

In these formulas E_a, E_1 and E_2, etc., are the elasticity moduli of the variants and c_1 is volumetric concentration of tungsten carbide [Abstracter's note: c_2 is not explained]. The results thus obtained confirm the previous deductions pertaining to the WC-Co structure. These deductions were based on the relation of electrical

L 18077-63

ACCESSION NR: AP3004600

resistivity as well as on the physical and mechanical properties of these alloys to their content of Co. Orig. art.has: 6 formulas and 3 figures.

ASSOCIATION: Vsesoyuzny*y nauchno-issledovatel'skiy institut tverdy*kh splavov (All-Union Scientific Research Institute of Hard Alloys)

SUBMITTED: 19Apr62	DATE ACQ: 27Aug63	ENCL: 00
SUB CODE: ML	NO REF SOV: 009	OTHER: 005

Card 3/3

L 23931-65 EPF(n)-2/EPR/EPA(s)-2/EWP(k)/EWT(m)/EWP(b)/T/EWA(d)/EWP(e)/EWP(v)/EWP(t) Pf-4/Ps-4/Pt-10/Pu-4/Pad IJP(c) AT/WH/WW/JD/HM/HW/JG/WB/MLK

ACCESSION NR: AT4030802 S/0000/63/000/000/0167/0171

AUTHOR: Tumanov, V. I.; Funke, V. F.; Belen'kaya, L. I.

TITLE: Wettability of NbC-VC and NbC-TiC carbide alloys by nickel

SOURCE: AN UkrSSR. Institut metallokeramiki i spetsial'nykh splavov. Poverkhnostnyye yavleniya v rasplavakh i protsessakh poroshkovoy metallurgii (Surface phenomena in liquid metals and processes in powder metallurgy). Kiev, Izd-vo AN UkrSSR, 1963, 167-171

TOPIC TAGS: nickel, carbide alloy, binary alloy, niobium carbide, vanadium carbide, alloy wettability, vanadium, titanium, niobium, nickel alloy, cemented carbide, cermet, nickel wetting action

ABSTRACT: Hot-compacted disks (h = 4mm, ϕ = 20mm) of binary carbides (see Table 1 of the Enclosure) were tested for wettability by 99.9% pure electrolytic nickel. The contact wetting angle θ was determined in a vacuum at 1400C, after a 15 minute period required to attain equilibrium, using the droplet-at-rest method. The best wettability of the carbide systems tested was observed at a ratio of components NbC:TiC or NbC:VC equal or close to 1:1. This can be a result of a higher

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L 23931-65
ACCESSION NR: AT4030802

ionization of carbon atoms which neutralize negative metal ions and facilitate wetting, or a result of composition-dependent changes in the surface energy of solid solutions. Orig. art. has: 2 tables and 2 graphs.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov, Moscow (All-Union Scientific Research Institute for Solid Alloys)

SUBMITTED: 23Nov63 ENCL: 02 SUB CODE: MM

NO REF SOV: 002 OTHER: 004

Card 2/4

L 23931-65
ACCESSION NR: AT4030802

ENCLOSURE: 01

Table 1.
Pressing temperature and carbide properties

Carbide composition, mol.%	Pressing temp., °C	Density, d g/cm³	Chemical composition		C for NI, degrees
			Total C, %	Free C,%	
NbC	2400	6,9	11,51	0,36	21
VC	2100	3,74	19,78	2,48	14
NbC — 72 VC — 28	2400	6,5	12,52	0,79	12
NbC — 48 VC — 52	2200	6,0	15,45	1,75	9
TiC	2200	4,8	19,26	0,08	20
TiC — 16 NbC — 84	2200	4,0	10,42	0,36	18
TiC — 32 NbC — 68	2350	6,44	10,08	0,37	12

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ACCESSION NR: AT4030802

ENCLOSURE: 02

Continuation of Table 1.

TiC — 44 NbC — 56	2400	5,61	11,3	0,42	6
TiC — 55 NbC — 45	2250	6,4	13,17	0,99	13
TiC — 74 NbC — 26	2250	5,7	12,24	0,69	16
TiC — 87 NbC — 13	2200	5,28	11,93	0,79	12

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S/032/63/029/003/004/020
B117/B186

AUTHORS: Tumanov, V. I., Trukhanova, Z. S., Funke, V. F., and Shcherbakov, V. G.

TITLE: Electrochemical separation and investigation of the cementation and the carbide phases of high tungsten cobalt alloys

PERIODICAL: Zavodskaya laboratoriya, v. 29, no. 3, 1963, 277-280

TEXT: To determine the composition of the binding phase in WC - Co alloys it was suggested to separate electrochemically the binding and the carbide phase, and to analyze chemically the alloying components. Caustic soda and hydrochloric acid solutions were used as electrolytes and spectroscopically pure graphite electrode as cathode for the electrochemical phase separation. The polarization curves plotted for pure WC and Co at 25°C showed: In 3 M HCl solution, Co dissolves intensely at an anode potential of ~0.1 v and a current density of 0.03 a/cm^2. The anode potential of WC is 0.5 v without voltage applied. When the potential increases to 1.1 - 1.2 v, gaseous chlorine is

separated out and the carbide oxidizes. In 6 M NaCl solution the anode potentials of Co and WC are 0.5 and 0.20 v without voltage being applied. At ~ 0.6 a/cm^2, an intensive discharge of oxygen occurs at the WC anode. WC oxidizes to WO_3, and decomposes to sodium tungstate at ~ 0.8 v. On the Co anode, oxygen is separated out at ~ 0.8 v, and the anode becomes passive. The difference in anode potentials of WC and Co permits the electrochemical separation of the binding and the carbide phase. In electrolytes of different concentrations the WC and Co phases could be dissolved selectively even at high current densities. Optimum conditions for isolating the binding and the carbide phase: for the Co phase, 6 M HCl, 0.03 a/cm^2, electrode voltage 0.8 - 0.9 v; for the WC phase, 6 M NaOH, 0.6 a/cm^2, and 3 v. The method was used to separate the phases mentioned in WC - Co alloys containing molybdenum, chromium, and aluminum. The phase composition and the lattice constant of the Co phase in alloys containing less than 4% by weight of Co could be determined by electrolytic enrichment with Co of the alloy surface. There are 2 figures and 4 tables.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov (All-Union Scientific Research Institute of High Alloys)

TUMANOV, V.I.; FUNKE, V.F.; PAVLOVA, Z.I.; IL'IN, Yu.F.

Determination of the tensile strength of solid alloys. Zav.lab. 29 no.8:981-983 '63. (MIRA 16:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov.
(Alloys--Testing)

FUNKE, V.F.; YUDKOVSKIY, S.I.

Conditions of preparation and phase composition of molybdenum boride. Zhur. prikl. khim. 36 no.11:2379-2385 N '63. (MIRA 17:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov.

L 13676-63 EWP(q)/EWT(m)/BL AFFTC/ASD JD/JG

ACCESSION NR: AP3004064 S/0076/63/037/007/1557/1562

57
56

AUTHOR: Funke, V. F.; Yudkovskiy, S. I.

TITLE: High-temperature oxidation of titanium boride alloys with iron-group metals

SOURCE: Zhurnal fizicheskoy khimii, v. 37, no. 7, 1963, 1557-1562

TOPIC TAGS: refractory compound, transition-metal boride, titanium boride, titanium boride-iron, titanium boride-nickel, titanium boride-cobalt, titanium boride-iron oxidation, titanium boride-nickel oxidation, titanium boride-cobalt oxidation, titanium oxide, $NiTiO_3$, $CoTiO_3$, ferric oxide, ferrous oxide

ABSTRACT: The kinetics of the atmospheric oxidation of TiB_2-Fe, -Ni, or -Co alloys has been studied within the 500—1000C range by determination of gain in weight over a period of 100 hr. The alloys were prepared by compacting and sintering. Oxidation was carried out in corundum crucibles at a constant temperature maintained for the predetermined period of time. X-ray diffraction

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patterns of the scale were obtained in an RKD, Debye-type chamber with a Co source. The experimental kinetic data are plotted in Fig. 1 of the Enclosure. The calculated oxidation rate-constants (k) are plotted as log k versus 1/T or versus the percentage of Fe, Ni, or Co. It was concluded that the oxidation rate at 500 and 750C is approximately of the same order of magnitude for all the alloys studied. A difference in this rate appears only when the temperature is increased from 750 to 1000C: in this range the oxidation rate increases faster in TiB_2-Fe than in TiB_2-Ni or TiB_2-Co alloys. The difference in the oxidation rate with the increased temperature is associated with a change in the appearance of the oxide film. The film on TiB_2-Fe alloy treated at 1000C is composed of two unequally thick layers, while a single-layer film appears on all alloys treated at 500 or 750C and on TiB_2-Ni or TiB_2-Co alloys treated at 1000C. At 500C, an increase in Fe, Ni, or Co content up to about 10% does not affect the oxidation rate, which remains about the same for all alloys. However, at 1000C the oxidation rate of the TiB_2-Fe alloy increases continuously as the Fe content is increased from 10 to 30% and is much higher than the rate for pure TiB_2 or for TiB_2-Ni or TiB_2-Co alloys. At 1000C the oxidation rate of the two alloys decreases with an increase in Ni or Co content to 6—7% and then remains stationary but lower than that of the pure TiB_2 as the percentage of Ni or Co is

L 13676-63

ACCESSION NR: AP3004064

further increased to 25%. The assumption that oxidation resistance at 750—1000C is dependent on the composition of the oxide films was confirmed by x-ray phase analysis. The scale for all the alloys contained TiO_2 and an unknown phase, presumably the complex oxide $Me_xB_yO_z$ or a salt of a boric acid. In addition the scale on certain TiB_2-Fe, -Ni, or -Co alloys contained FeO or α-Fe_2O_3, $NiTiO_3$, or $CoTiO_3$. The proportions of the different phases varied with alloy composition and temperature. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: Vsesoyuzny*y nauchno-issledovatel'skiy institut tverdy*kh splavov (All-Union Scientific Research Institute of Hard Alloys).

SUBMITTED: 06Aug63 DATE ACQ: 15Aug63 ENCL: 01

SUB CODE: MA,ML NO REF SOV: 006 OTHER: 002

Card 3/3

ACCESSION NR: AP4019817 S/0279/64/000/001/0170/0175

AUTHORS: Tumanov, V. I. (Moscow); Funke, V. F. (Moscow); Baskin, M. L. (Moscow); Novikova, T. A. (Moscow)

TITLE: Temperature effect on physical properties of tungsten carbide and cobalt alloys

SOURCE: AN SSSR. Izv. Metallurgiya i gornoye delo, no. 1, 1964, 170-175

TOPIC TAGS: cermet alloy, metalloceramic solid alloy, WC+Co alloy, WC+Co physical properties, WC grain size, WC+Co thermal expansion, WC + Co electrical resistivity

ABSTRACT: This work was carried out in order to determine the variation in the elasticity modulus, linear expansion coefficient, and specific electrical resistivity of WC+Co with respect to the temperature changes (800-1000C), the cobalt content, and the grain size of the WC-phase. The samples consisted of two sets: 1) the alloys containing 0-50 wt% of Co and made up of equal WC-phase grains (2.9-2.6 μ); 2) the alloys with a constant Co content (6%) and with varied grain sizes of the WC-phase (1.7-3.7 μ). The results are shown on Figures 1, 2 and 3 of the

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ACCESSION NR: AP4019817

Enclosures. The authors conclude that the experimental data confirmed the general idea that Co may occur in WC-Co alloys either in the form of thin capillary films or in large inclusions. The varying amounts of the two forms determine the alloy properties with the change in Co content and grain size of the WC-phase. Orig. art. has: 1 table and 3 figures.

ASSOCIATION: none

SUBMITTED: 15May63 DATE ACQ: 31Mar64 ENCL: 03

SUB CODE: ML NO REF SOV: 007 OTHER: 001

Card 2/5

ACCESSION NR: AP4029208 S/0226/64/000/002/0057/0060

AUTHOR: Tumanov, V. I.; Funke, V. F.; Trukhanova, Z. S.; Novikova, T. A.; Kuznetsova, K. F.

TITLE: Heat treatment of tungsten carbide-cobalt alloys

SOURCE: Poroshkovaya metallurgiya, no. 2, 1964, 57-60

TOPIC TAGS: tungsten carbide, cobalt, heat treatment, carbon, tungsten, tungsten carbide based alloy, cobalt containing alloy, binding phase

ABSTRACT: In this paper the authors present the results of studies of the effect of the cooling rate on the composition of the binding phase and the bending strength of tungsten carbide-cobalt alloys. The effect of the cobalt content is plotted in graphs. The authors draw the following conclusions: 1) the composition of the binding phase does not, in practice, depend on the cooling rate within the investigated temperature range, and 2) in the examination of the dependence of the bending strength on the composition of tungsten carbide-cobalt alloys, it is also necessary to consider the change of thermal stresses. Orig. art. has: 3 figures.

ASSOCIATION: Vsesoyuzny*y nauchno-issleovatel'skiy institut tverdy*kh spalvov (All-Union Scientific Research Institute of Solid Alloys)

Card 1/2 Sub 21 Jan63

ACCESSION NR: AP4044913 S/0226/64/000/004/0076/0079

AUTHOR: Funke, V. F.; Panov, V. S.

TITLE: Effect of production conditions on the composition and properties of TiC-WC-Co alloys

SOURCE: Poroshkovaya metallurgiya, no. 4, 1964, 76-79

TOPIC TAGS: titanium alloy, tungsten alloy, titanium tungsten alloy, metal carbide, sintered alloy, powder metallurgy, cobalt impurity, vacuum sintering

ABSTRACT: There are few published papers on the effect of vacuum sintering on the properties of hard sintered alloys, such as metal carbides and titanium tungsten alloys, but it is well known that the properties of the carbides and alloys depend to a great extent on the carbon content. The experiments described in this paper show the effect of furnace rarefaction on the carbon content in solid solutions on a TiC base, as well as on the properties of a hard titanium tungsten alloy of the type T15K6. The alloys for the test were prepared in the usual way. The combined carbon content was 0.4-0.8% higher in the carbide produced in a vacuum than in that produced in hydrogen, but the quantity of free carbon was also higher. Variation in the degree of rarefaction influences the content of combined carbon only slightly. However, in the T15K6 alloy, variation in the vacuum changes the cobalt

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ACCESSION NR: AP4044913

content (Figs. 1 and 2 of the Enclosure). The sintering temperature is of even greater importance for the cobalt content than the degree of rarefaction. The strength of T15K6 alloy prepared in vacuo was also compared with samples sintered in hydrogen. These results confirmed that sintering of T15K6 alloys in a vacuum increases their strength on the cutting lathe and in bending tests. Orig. art. has: 3 tables and 2 figures.

ASSOCIATION: Vsesoyuzny*y nauchno-issledovatel*skiy institut tverdy*kh splavov (All-Union Scientific Research Institute of Hard Alloys)

SUBMITTED: 06May63 ENCL: 02 SUB CODE: MM

NO REF SOV: 007 OTHER: 004

Card 2/4

ENCLOSURE: 01

ACCESSION NR: AP4044913

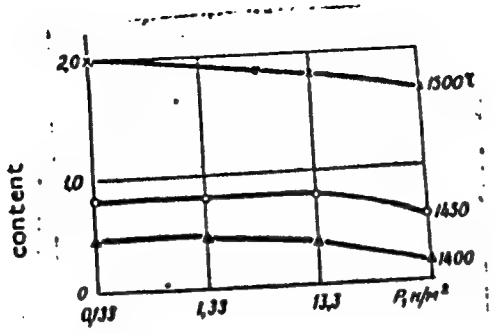

Fig. 1. Lowering of the cobalt content in T15K6 alloy in relation to the rarefaction in the furnace. Data given as averages of 3-5 sets. Ordinate = cobalt content in wt.%.

Card 3/4

ENCLOSURE: 02

ACCESSION NR: AP4044913

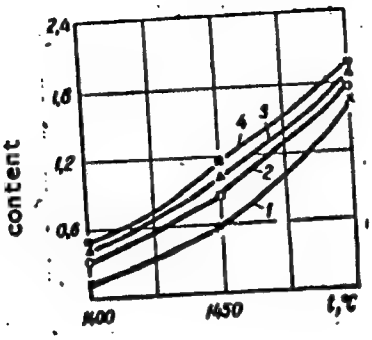

Fig. 2. Lowering of the cobalt content in the alloy in relation to sintering temperature. Rarefaction in the furnace, n/m^2 (1 mm Hg=133.3 n/m^2): 1 - 133.3; 2 - 13.3; 3 - 1.33; 4 - 0.133.
Ordinate = cobalt content in wt.%.

Card 4/4

ACCESSION NR: AP4039622 S/0076/64/038/005/1280/1283

AUTHOR: Funke, V. F.; Yudkovskiy, S. I.

TITLE: High-temperature oxidation of boride-base alloys with iron-group metals

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 5, 1964, 1280-1283

TOPIC TAGS: zirconium boride, zirconium boride alloy, iron containing alloy, cobalt containing alloy, alloy oxidation, high temperature oxidation

ABSTRACT: The oxidation of zirconium boride-base alloys with iron-group metals in the 500—1000C range was investigated. The oxidation behavior of unalloyed zirconium boride at 500—750C differs from that of zirconium boride alloys; in the former a weight loss is observed and in the latter, a weight gain. The phenomenon is explained by the difference in the nature of oxide films formed at high temperatures. The film formed on zirconium boride is porous and does not prevent the escape of volatile components; on alloys, a glass-like dense film, adhering tightly to the base is formed. With an

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ACCESSION NR: AP4039622

increase in oxidation temperature to above 750C, the oxidation follows a parabolic rate and is accompanied by a weight increase in both cases (see Fig. 1 of the Enclosure). X-ray diffraction patterns of oxide films on zirconium boride formed at 1000C contain primarily lines of monoclinic zirconium dioxide. Components of film on the alloys could not be positively identified. With increasing oxidation temperature, the content of metals in the film increases. The oxidation resistance of zirconium boride base alloys is 2—3 times higher than that of titanium boride-base alloys.

ASSOCIATION: Vsesoyuzny*y nauchno-issledovatel'skiy institut tverdy*kh splavov (All-Union Scientific Research Institute of Hard Alloys)

SUBMITTED: 13Mar63 ATD PRESS: 3049 ENCL: 01

SUB CODE: MM NO REF SOV: 004 OTHER: 001

Card 2/3

AP4039622

ENCLOSURE: 01

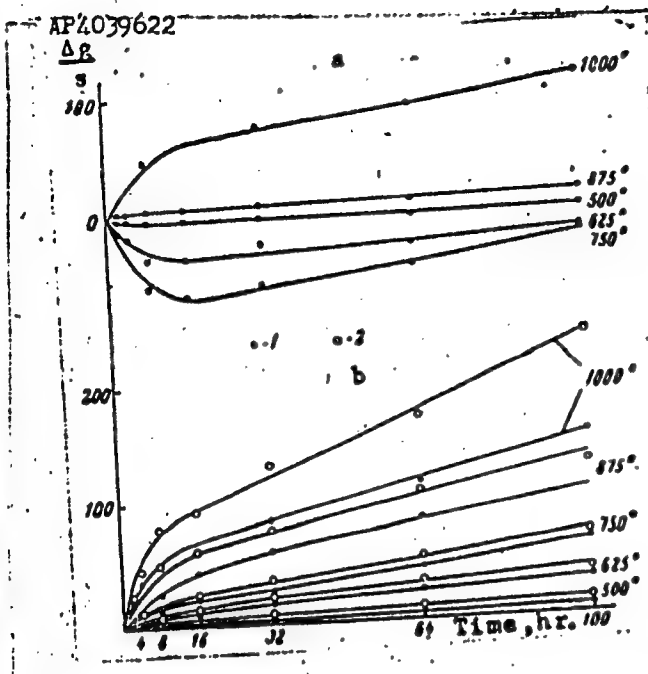


Fig. 1. Weight gain - time curves

a - Zirconium boride; b - alloys: 1 - ZrB_2 + 14.4% Fe; 2 - ZrB_2 + 22.9% Fe.

Card 3/3

L 32247-65 EWP(e)/EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(k)/EWP(b) Pf-4 IJP(c)
JD

ACCESSION NR: AR5004788 S/0137/64/000/010/I080/I080

34
32
B

SOURCE: Ref. zh. Metallurgiya, Abs. 10I573

AUTHOR: Yudkovskiy, S. I.; Eykhmans, E. F.; Guseva, A. N.; Funke, V. F.; Romanov, K. F.; Smirnov, F. F.

TITLE: Cutting and physicomechanical properties of alloys with a titanium boride base

CITED SOURCE: Sb. tr. Vses. n.-i. in-t tverdykh splavov, no. 5, 1964, 130-141

TOPIC TAGS: titanium base alloy, boron containing alloy, iron containing alloy, titanium diboride alloy, metal mechanical property, metal physical property, cutting tool

TRANSLATION: Results of an investigation of the cutting and physicomechanical properties of alloys based on titanium diboride are described. The alloys are outstanding for a high degree of hardness, ability to retain strength at high temperatures, a small friction coefficient, a high temperature for the start of adhesion to

Card 1/2

L 32247-65
ACCESSION NR: AR5004788

material, and a high resistance to scaling. The best cutting properties are exhibited by alloys with iron as a binder (alloys of TiB_2+15%Fe). Alloys based on titanium diboride can be used as materials for tools, including tools for machining heat resistant alloys. 11 literature titles. L. Romancheva.

SUB CODE: MM ENCL: 00

Card 2/2

L 45061-65 EPF(c)/EWT(m)/EWP(b)/EWA(d)/EWP(t)/EWP(e) IJP(c) JD/WB

ACCESSION NR: AR5008960 S/0277/65/000/001/0026/0027

SOURCE: Ref. zh. Mashinostroitel'nyye materialy, konstruktsii i raschet detaley mashin. Otd. vyp., Abs. 1.48.136

AUTHOR: Funke, V. F.; Yudkovskiy, S. I.

TITLE: High-temperature oxidation of alloys of titanium boride with metals of the iron group

CITED SOURCE: Sb. tr. Vses. in-t tverdykh splavov, no. 5, 1964, 142-151

TOPIC TAGS: titanium boride alloy, high temperature oxidation, alloy oxidation, transition metal alloy

TRANSLATION: The authors studied the kinetics of oxidation of TiB_2 - Fe(Co,Ni) alloys at 500, 750 or 1000C and exposures of 100 hrs. The content of Fe varied from 0.019 to 29.89%, Ni from 7.19 to 46.19% and Co from 6.10 to 25.03%. Rates of oxidation showed similar orders of magnitude for all three listed alloys at 500-750C. The rate of oxidation at 1000C increased significantly as the content of iron increased, while an increase in Ni or Co reduced it slightly. Bibl. with 6 titles. L. Gomozov

SUB CODE: MM ENCL: 00

Card 1/1

L 60439-65 EPF(n)-2/EPR/EWP(k)/EWP(z)/EWT(m)/EWG(m)/EWP(b)/EWP(e)/EWP(t)
Pf-4/Ps-4/Pu-4 IJP(c) JD/JG
ACCESSION NR: AP5016528 UR/0126/65/019/006/0858/0862 44
546.261 43
B

AUTHOR: Funke, V. F.; Tumanov, V. I.; Panov, V. S.

TITLE: Structure and physical properties of WC-TaC-Co and WC-NbC-Co alloys

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 6, 1965, 858-862

TOPIC TAGS: physical metallurgy, mechanical property, powder metallurgy, carbide phase, alloy constitutional diagram, chemical analysis

ABSTRACT: Experimental data are given for the basic physical properties of WC-TaC-Co and WC-NbC-Co alloys and the relationship of these to the composition and structure is shown. X-ray, metallography, and electrochemical tests were done on the above systems for Co compositions ranging from 7 to 25 wt% with varying ratios of RaC(NbC):WC. The alloys were made by powder metallurgy, and a ternary diagram shows the solubility of WC in TaC(NbC) at 1500°C. X-ray and chemical methods were used to determine the solubility of TaC(NbC) in Coβ. Only 0.3 wt% TaC could be dissolved in Coβ, compared to 3.5 wt% NbC. Such physical properties as coefficient

Card 1/2

L 60439-65

ACCESSION NR: AP5016520

of linear expansion (α), Young's modulus (*E*), Vickers hardness (*HV*), and electrical resistivity (ρ) are tabulated for the separate phases: WC, NbC, TaC and Co. The effects on these properties of adding TaC(NbC) to the 7 and 25 wt% Co mixture are presented graphically. An anamolous change in the properties of the alloys for increasing contents of TaC(NbC) occur at about 10 mol% and an explanation of this effect is given, based on the change in composition of the binding phase and the character of its distribution. Orig. art. has: 4 figures, 2 tables.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov (All-Union Scientific-Research Institute of Hard Alloys)

SUBMITTED: 31Jan64 ENCL: 00 SUB CODE: MM

NO REF SOV: 006 OTHER: 000

Card 2/2

PONKE, V.F.; PUDOVSKIY, G.I.; Prinimali uchastiye: CHERENKOVA, V.A.; [illegible]OV, V.I.

High temperature oxidation of alloys of zirconium boride with iron group metals. Zhur. fiz. khim. 38 no.5:1280-1283 My '64. (MIRA 18:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov. Submitted March 13, 1963.

L 26595-66 EWT(m)/EWP(e)/EWP(w)/ETC(f)/EWG(m)/T/EWP(t) IJP(c) JD/HW/JG/AT/

ACC NR: AP6013364 WH SOURCE CODE: UR/0370/66/000/002/0120/0124

AUTHOR: Panov, V.S. (Moscow); Meyerson, G.A. (Moscow); Funke, V.F. (Moscow)

ORG: none

TITLE: Structure and physical and mechanical properties of WC-TaC-Co hard alloys

SOURCE: AN SSSR. Izvestiya. Metally, no. 2, 1966, 120-124

TOPIC TAGS: metal cutting, tungsten carbide, tantalum compound, cutting tool, carbide abrasive, bend strength, toughness, hardness, cobalt alloy

ABSTRACT:

The authors, in cooperation with the All-Union Scientific Research Institute of Hard Alloys (VNIITS), investigated the effect of composition, structure, and temperature on the bend strength, impact toughness, and hardness of a variety of WC-TaC-Co sintered carbides used in cutting tools for machining heat-resistant and other hard and tough materials.

It was found that alloys containing 2—90 mol% TaC (in respect to total WC+TaC) have a three-phase structure (WC, TaC, and Co), while those containing over 90 mol% TaC have a two-phase structure (TaC and Co).

Card 1/2 UDC: 669.017.13

L 26595-66

ACC NR: AP6013364

2

Additions of 2—5 mol% TaC increase considerably the hardness of sintered carbides at 20°C and the bending strength at 800°C, while the impact toughness and bend strength at 20°C remain about the same or decrease very slightly. However, a further increase in TaC content greatly lowers the bend strength of all sintered-carbide specimens.

An increase in cobalt content improves the bend strength at both 20°C and 800°C. It reaches a maximun at 800°C with 12—16 wt% cobalt, and at 20°C with 20 wt% cobalt.

As a result of the investigation, the following optimal composition of WC-TaC-Co sintered carbide is recommended for machining hard and tough metals and alloys: 2—5 mol% TaC (re total WC+TaC) and 6—12 wt% cobalt, depending on the machining conditions and the material to be machined.

Orig. art. has: 3 figures. [ATD PRESS: 4237-F]

SUB CODE: 20, 13, 11 / SUBM DATE: 28Sep64 / ORIG REF: 012 / OTH REF: 008

Card 2/2 BLG

ACC NR: AR6035411 SOURCE CODE: UR/0137/66/000/009/A010/A010

AUTHOR: Funke, V. F.; Fumanov, V. I.; Kozlova, A. G.; Pshenichnyy, I. V.

TITLE: Wetting of the alloys TiC-ZrC and TiC-VC by liquid nickel

SOURCE: Ref. zh. Metallurgiya, Abs. 9A66

REF SOURCE: Sb. Poverkhnostn. yavleniya v rasplavakh i voznikayushchikh iz nikh tverd. fazakh. Nal'chik, 1965, 397-404

TOPIC TAGS: nickel, liquid metal, titanium alloy, carbide, metal surface, surface property, resistivity, hardness

ABSTRACT: The contact angle θ of nickel on sintered samples with compositions TiC-VC and TiC-ZrC was determined by the lying-drop method at 5×10^{-5} mm Hg, the electric resistivity ρ at 290K was determined by the eddy-current method, and the hardness was also determined. In the composition range 60 - 90 mol.% VC the value of θ for TiC-VC is 0 rad, i.e., these alloys are completely wetted by the nickel. A maximum $\rho > 250$ μohm-cm is observed at a VC content of 75 mol.%. In the TiC-ZrC system, the plots of ρ vs. composition and of θ vs. composition have a character similar to the TiC-VC alloys. The minimum values of θ, and accordingly the maximum values of ρ, are observed in alloys with 40 - 60 mol.% ZrC. The wetting by nickel of isomorphous carbides with cubic lattice of metals of groups IV - V improves with increasing ρ and with decreasing radius of the metallic atom. The value of θ decreases linearly to zero with decreasing free energy of carbide production. As the free energy of carbide production

Card 1/2 UDC: [699.295'784 + 669.24]: 532.64

ACC NR: AR6035411

increases on going from VC to ZrC in the VC - NbC - TiC - ZrC series, ρ decreases linearly and θ increases. In the wetting of the carbide, the principal role is played by the chemical interaction between the metal of the carbide and the liquid metal. 3 illustrations, 4 tables. Bibliography, 13 titles. M. Krasheninnikov [Translation of abstract]

SUB CODE: 11

Card 2/2

ACC NR: AP6036449 SOURCE CODE: UR/0370/66/000/006/0146/0153

AUTHOR: Funke, V. F. (Moscow); Panov, V. S. (Moscow)

ORG: none

TITLE: Structure and properties of solid solutions of tungsten carbide in titanium carbide, niobium carbide, and tantalum carbide

SOURCE: AN SSSR. Izvestiya. Metally, no. 6, 1966, 146-153

TOPIC TAGS: solid solution, crystal lattice, tungsten carbide, titanium carbide, niobium carbide, tantalum carbide, elastic deformation, ~~energy~~ carbide, titanium compound, niobium compound, tantalum compound

ABSTRACT: A study of the structure and properties of solid solutions of tungsten carbide in titanium carbide, niobium carbide, and tantalum carbide showed that an increase in the concentration of tungsten carbide is accompanied by an increase in hardness and specific electrical resistance and a decrease in the angle of contact of wetting by nickel. The greater the difference between WC and the carbide solvent in free energy and the enthalpy of carbide formation and the atomic number of the carbide metal, the greater the solubility (critical concentration) and changes in the

Card 1/2

UDC: 669.621.762

Card 2/2

S/121/60/000/010/009/015
A004/A001

AUTHOR: Funkel', E. V.

TITLE: Determining the Magnitude of the Tool Front Angle for the Relieving of Milling Cutters

PERIODICAL: Stanki i Instrument, 1960, No. 10, pp. 25-26

TEXT: The L. P. Shumakov method of correcting the profile of profile cutters consists in the fact that the front surface of the relieving tool, the profile of which agrees with the workpiece profile in the normal cross-section of the latter, is located at some front angle γ_t, which is smaller than the front angle γ_c of the relieved cutter. The author investigates the way of calculating γ_t. Assuming that the relieved cutter should machine an article, the profile depth of which in the normal cross-section is h, and taking that the cutting edge A of the outer spiral AE of the cutter is located on the cutting circumference of radius R, the cutting edge B of the inner spiral BF should be located on the circumference of radius r = R - h. The vertex C of the tool relieving the cutter on the inner spiral should be located on the sector BG, which is an extension of the spiral BF. The position of C should satisfy two demands: it should be located at the

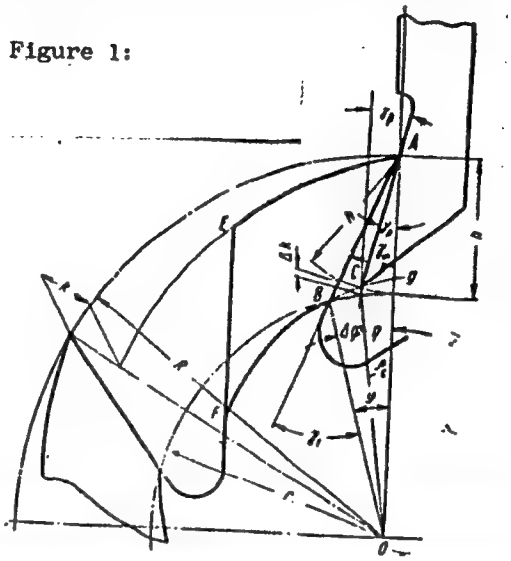
Determining the Magnitude of the Tool Front Angle for the Relieving of Milling Cutters

distance AC = h from the cutter tooth vertex A and on the extension of BO of the inner spiral BF. Thus the point C is the point of intersection of the circle of radius h whose center is located at point A, with the Archimedean spiral FO passing through point B. The straight line connecting A and B should constitute with the cutter radius OA an angle equal to γ_c. The length of the radius vector of the spiral at point C is equal to

$$\rho_c = r + a(\varphi - \gamma_1), \qquad (1)$$

where r = radius vector of the spiral at point B, equal to the radius of the inner cutting circle (r = R - h), a = Archimedean spiral constant: $a = \frac{kz}{2\pi}$, $\varphi = \gamma_1 - \gamma$, $\eta =$

Figure 1:



Card 2/4

Determining the Magnitude of the Tool Front Angle for the Relieving of Milling Cutters

central angle formed by the spiral radius vector at point C with radius OA, k = the magnitude of back slant per one cutter tooth, z = number of cutter teeth, γ_1 = front angle of cutter at point B: $\gamma_1 = \arcsin \frac{R \sin \gamma}{r}$. The equation of a circle of radius h centered at point A has, in the polar coordinate system with the pole at point O, the following form:

$$\rho^2 - 2\rho R \cos \eta + R^2 - h^2 = 0. \quad (5)$$

Substituting the value of ρ from expression (1) into equation (5), one obtains, after transformations

$$r^2 - 2aR(\varphi - \eta) + a^2(\varphi - \eta)^2 - 2Rr \cos \eta - 2aR(\varphi - \eta) \cos \eta + R^2 - h^2 = 0. \quad (6)$$

In order to solve this transcendental equation, $\cos \eta$ is developed into series $\cos \eta = 1 - \frac{\eta^2}{2!} + \frac{\eta^4}{4!} + \frac{\eta^6}{6!} + \ldots$ In view of the relative smallness of the angle, it is possible to take only the first two terms of the series, i. e. $\cos \eta = 1 - \frac{\eta^2}{2}$. Moreover, at an angle of $\leqslant 22^\circ$ the relative error does not exceed 0.001 and rapidly diminishes with a decrease of η. After substitution of this $\cos \eta$ value into equation (6) and some algebraic tranformations, taking into account that

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Determining the Magnitude of the Tool Front Angle for the Relieving of Milling Cutters

$R^2 - 2Rr + r^2 = h^2$, the following equation is obtained:

$$\eta^3 - \frac{a^2 + aR\varphi + Rr}{aR}\eta^2 - \frac{2ah - 2a^2\varphi}{aR}\eta + \frac{2ah\varphi - a^2\varphi^2}{aR} = 0. \quad (7)$$

The roots of the cubic equation (7) are determined by the Cardan formula. The solution of the obtained cubic equation makes it possible to determine the value η and then, from the triangle AOC also the unknown magnitude of the angle γ_t. The author presents a calculation example. There is 1 figure.

Card 4/4

FUKARAK, P.; GAFNER, J.; MESTROVIC, S.; KLEPAC, D.; LNENICEK, Z.; ZHIJANAC, D.; SEVNIK, F.; ZAGAR, B.; MIKLAVZIC, J.; KNEZ, A.; PIPAN, R.; FUNKL, L.; SVETLICIC, A.; ZUMER, L.; PETC, R.

Revolw of periodicals; silviculture. Gozd in Les Youg 9 no.4/5:144-145 Ag-O '64.

FUKS, B.A.

RT-723 [Natural boundaries of analytic functions of complex variables] Estestvennye granitsy analiticheskikh funktsii kompleksnykh peremennykh.
Uspekhi Matematicheskikh Nauk, 5(4): 75-120, 1950.

18.8100 1418 1402 1530
24.7500 1144, 1160, 1482, 2108 26593
1.1210 2808, 3008, 3108 S/056/61/041/005/008/036
B109/B102

AUTHORS: Al'tshuler, L. V., Kormer, S. B., Bakanova, A. A., Petrunin, A. P., Funktikov, A. I., Gubkin, A. A.

TITLE: Irregular conditions of oblique collision of shock waves in solids

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 5(11), 1961, 1382 - 1393

TEXT: On the basis of papers by V. Blikney, A. Taub (Sb. Voprosy raketnoy tekhniki, 1, 1951), L. D. Landau, Ye. M. Lifshits (Mekhanika sploshnykh sred - Mechanics of Continuous Media, Gostekhizdat, 1954), O. S. Ryzhov, S. A. Khristianovich (PMM, 22, 586, 1958), Ya. B. Zel'dovich, Gandel'man, and Ye. A. Feoktistova (DAN SSSR, 136, 1325, 1961) the authors describe a method of producing and recording irregular conditions for the collision of shock waves in solids. The experimental arrangement is shown in Fig. 2a. The detonation waves which enter the specimen at a slant cause shock waves with amplitudes of between 3 and 4 . 10^5 atm. Another arrangement allowed reaching shock waves of 1 - 1.8 . 10^6 atm. The parameters of the

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three-shock configuration forming as a result of the collision of the shock waves, are given for aluminum, lead, iron, and copper bodies. Near the critical angle at which a shock wave can still arise pressure was found to rise by from 6 to 8 times. When the waves have greater amplitudes, pressure in the collision region rises up to $4 \cdot 10^6$ atm in aluminum. In steel, copper, and lead it may even reach $7 \cdot 10^6$ atm if the waves collide at right angles. The results are analyzed by means of the method of the impact polars. It is shown that the picture with only one tangential discontinuity cannot be employed in describing the irregular conditions of the oblique collision of weak shock waves in the metal. The authors present a method of determining pressure and density behind the reflected wave front from the parameters of the three-shock configuration. Pressure and density for the collision of strong shock waves in aluminum were calculated as examples. It was found that the incident and reflected waves increase the density of aluminum up to 6.12 g/cm^3. M. P. Speranskaya, N. S. Tenigin (deceased), A. N. Kolesnikova, M. S. Shvetsov, L. N. Gorelova, and M. V. Sinitsyn are thanked for assistance and information. There are 14 figures, 3 tables, and 9 Soviet references.

SUBMITTED: May 18, 1961

FUNTIKOVA, T. V.

"New Organophosphorous Compounds for Control of Fasciolosis of Animals"
Paper presented at Kn First Conference on Phosphorous Compounds, Kazan, 7-10 Dec 55

Ref: Zh-3,084,341

Mbr., Kazan Sci. Res. Veterinary Inst. in 1955.
SO: Khimiya Primenniya Fosfoorganicheskiy Soyedeniy, Moscow, 1957, Uncl

FUNNIKOVA S.V

USSR/Diseases of Farm Animals - Diseases Caused by Helminths. R.

Abs Jour : Ref Zhur - Biol., No 6, 1958, 26312

Author : Funnikova, S.V.

Inst : Academy of Medical Sciences, USSR

Title : New Organophosphorus Compounds in the Fight Against Liver-Fluke Disease (Fascioliasis) in Animals.

Orig Pub : In the book: Khimia i primeneniya fosfororg. soyedineniy, M., AN SSSR, 1957, 511-513

Abstract : Two organophosphorus preparations, dithio and pyrophose (I) which fatally affect mollusks, the transitory hosts of fasciolae, were suggested for the control of liver-fluke disease. The preparations were tested under laboratory conditions (by spraying the mollusks and by placing them into the reservoirs), as well as under natural conditions (by introducing the preparations into the

Card 1/2

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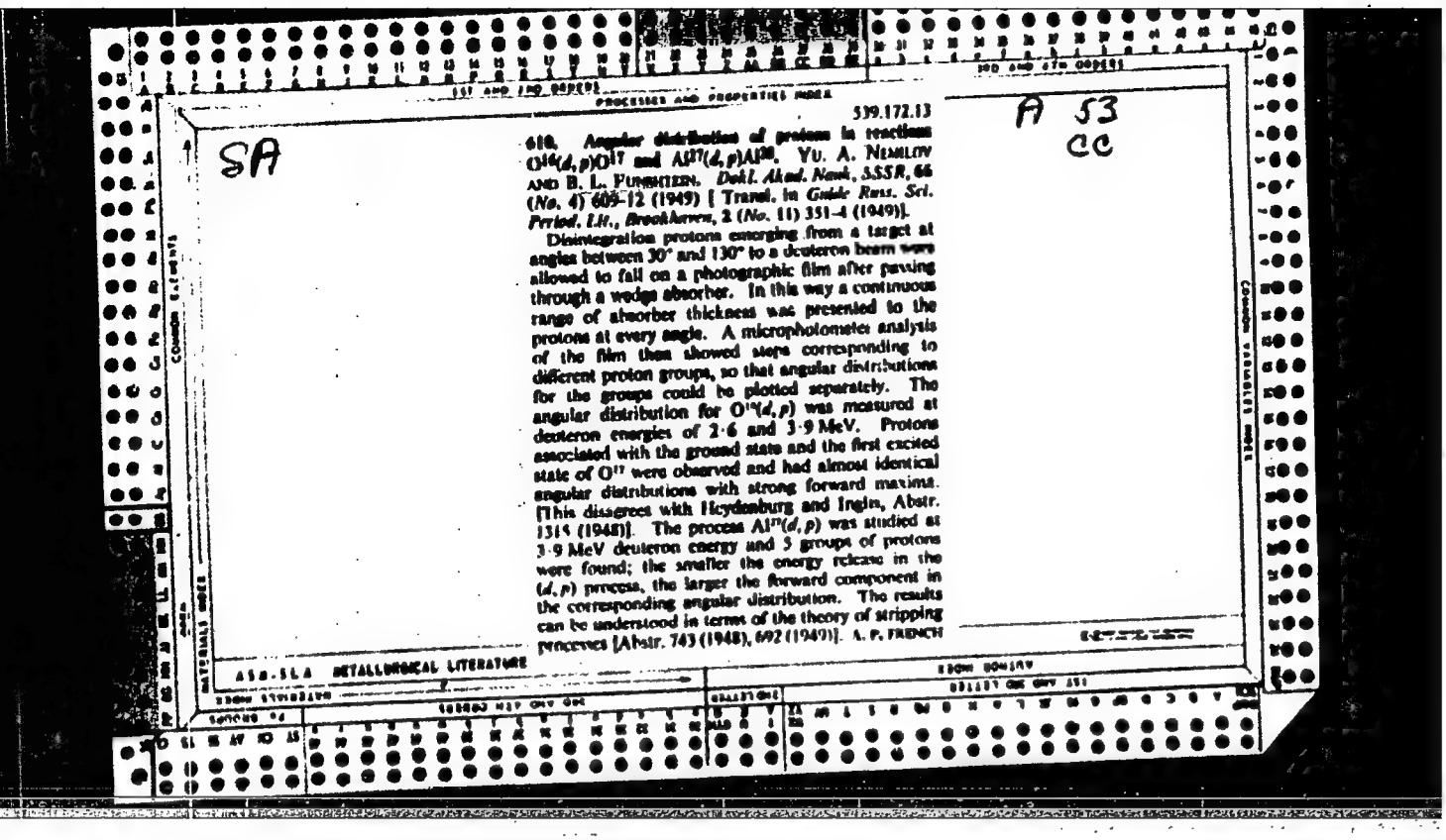
FUNNIKOVA, S.V., starshiy nauchnyy sotrudnik

Extermination of mollusks, intermediate hosts of Fasciola.
Veterinariia 40 no.7:61-63 Jl '63. (MIRA 16:8)

1. Kazanskiy veterinarnyy institut.
(Mollusks--Extermination) (Liver flukes--Host animals)



539.172.13

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CC

610. **Angular distribution of protons in reactions** $O^{16}(d,p)O^{17}$ **and** $Al^{27}(d,p)Al^{28}$. YU. A. NEMILOV AND B. L. FUNSHTEIN. *Dokl. Akad. Nauk, S.S.S.R.*, 66 (*No.* 4) 609–12 (1949) [Transl. in *Guide Russ. Sci. Period. Lit., Brookhaven*, 2 (*No.* 11) 351–4 (1949)].

Disintegration protons emerging from a target at angles between 30° and 130° to a deuteron beam were allowed to fall on a photographic film after passing through a wedge absorber. In this way a continuous range of absorber thickness was presented to the protons at every angle. A microphotometer analysis of the film then showed steps corresponding to different proton groups, so that angular distributions for the groups could be plotted separately. The angular distribution for $O^{16}(d,p)$ was measured at deuteron energies of 2·6 and 3·9 MeV. Protons associated with the ground state and the first excited state of O^{17} were observed and had almost identical angular distributions with strong forward maxima. [This disagrees with Heydenburg and Ingle, Abstr. 1315 (1948)]. The process $Al^{27}(d,p)$ was studied at 3·9 MeV deuteron energy and 5 groups of protons were found; the smaller the energy release in the (d,p) process, the larger the forward component in the corresponding angular distribution. The results can be understood in terms of the theory of stripping processes [Abstr. 743 (1948), 692 (1949)]. A. P. FRENCH

ASM-SLA METALLURGICAL LITERATURE

FUNSHTEYN, B. L., NEMILOV, Y. A. and ZHEREBTSOVA, K. I.

"Relationship between Probabilities of Stripping and Compound Nucleus Formation" a paper presented at the International Conference on Nuclear Reactions, Amsterdam, 2-7 July 1956.

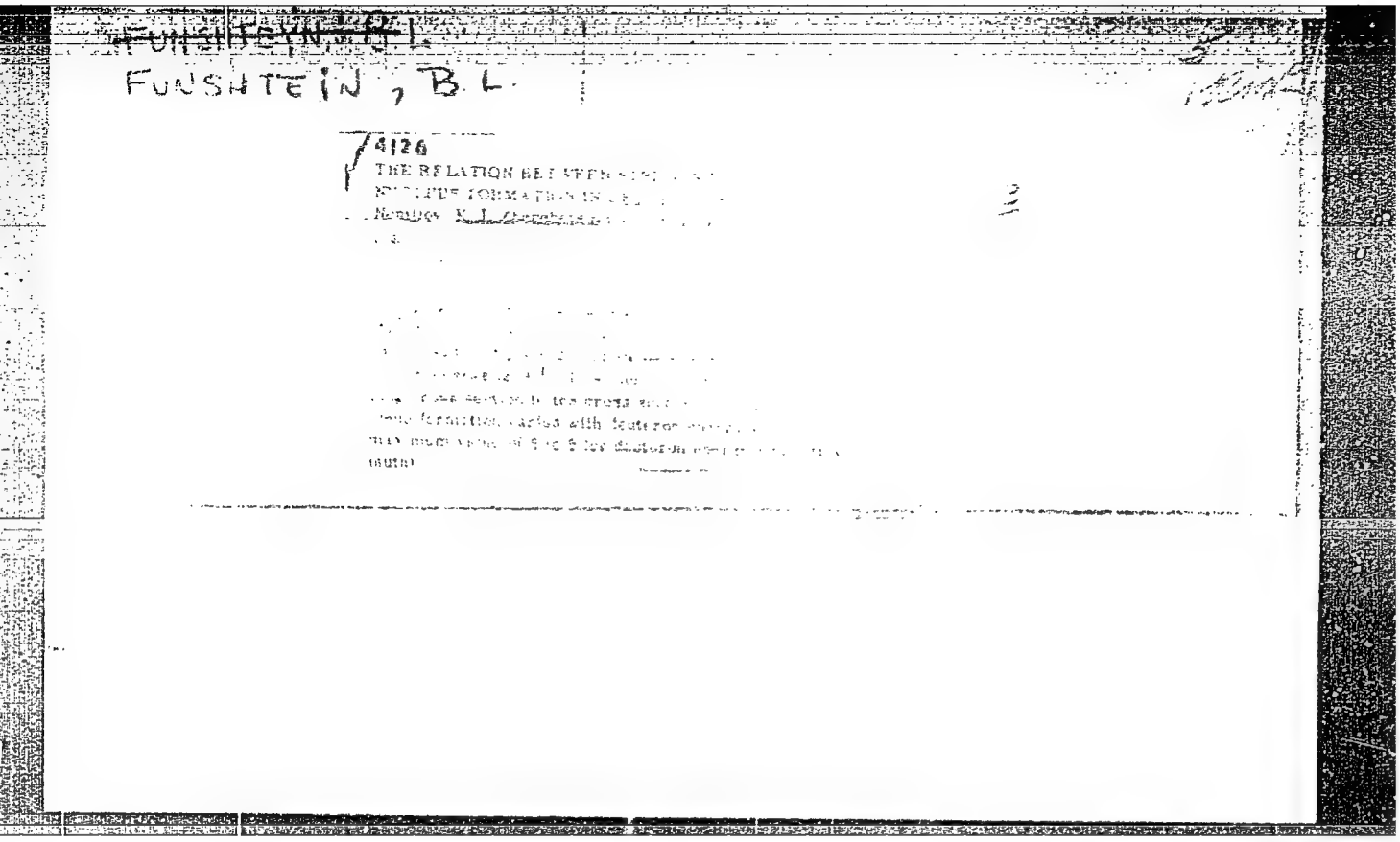
D551274

FUNSTEYN, B.L.

CARD 1 / 2 PA - 1406

SUBJECT USSR / PHYSICS
AUTHOR NEMILOV,JU.A., ZEREBCOVA,K.I., FUNSTEJN,B.L.
TITLE On the Relationship between the Processes of Stripping and the Production of a Compound Nucleus on the Occasion of Reaction with Deuterons.
PERIODICAL Žurn.eksp.i teor.fis, 30, fasc.6, 1013-1016 (1956)
Issued: 8 / 1956 reviewed: 10 / 1956

The relationship of these reactions on the nucleus $Mg^{26}(d,p)Mg^{27}$ is here estimated by comparison of the yields of those nuclei which are produced on the occasion of d,p-processes and d,α-processes on an Mg^{26} nucleus as well as on the occasion of n,p-processes and n,α-processes on an Al^{27} nucleus. For the purpose of a more accurate quantitative estimation of the relative probabilities of the two mechanisms mentioned in the title two reactions are selected (one of them with deuterons and the other with any other data as e.g. neutrons), in which one and the same compound nucleus is produced. The radioactive nuclei B_1 and B_2 created in connection with the reactions selected on this occasion had decay periods which, from the point of view of measuring technique, were favorable. The ratios of the quantities of radioactive nuclei B_1 and B_2 produced in the targets by irradiation with deuterons and neutrons were determined from the fading curves of radioactivity. It is true that: $\sigma(d,p)/\sigma(d,\alpha)=(\sigma(d,P)_{c.n.}+\sigma(d,p)strip+F)/\sigma(d,\alpha)=N_1$ and $\sigma(n,p)/\sigma(n,\alpha)=N_2$. Here cn. refers to a compound nucleus, strip. to a stripping process, and F denotes the term due to the interference between the two terms. As the decay of the compound



FUNSHTEIN, B.L.

4126

THE RELATION BE[illegible]

[illegible] FORMATION [illegible]

Nerudov V.I. [illegible]

[illegible]

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[illegible] formation [illegible] with [illegible]

[illegible]

(auth)

ZHEREBTSOVA, K. I., MAKAROVA, T. P., NEMILOV, Yu. A. and FUNSHTEYN, B. L.

"Sur la production relative des etata isomeriques et fondamentaux ^{69}Zn produits dans des reactions nucleaires differentes."

report presented at the Intl. Congress for Nuclear Interactions (Low Energy) and Nuclear Structure (Intl. Union Pure and Applied Physics) Paris, 7-12 July 1958.

21(7) SOV/56-35-6-5/44

AUTHORS: Zherebtsova, K. I., Makarova, T. P., Nemilov, Yu.A., Funshteyn, B.L.

TITLE: On the Ratio Between the Yields of the Isomeric and the Ground State of Zn^{69}, Produced in Various Nuclear Reactions (O soot-noshenii mezhdu vykhodami izomernogo i osnovnogo sostoyaniy Zn^{69}, obrazuyemogo v rezul'tate razlichnykh yadernykh reaktsiy)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 6, pp 1355-1357 (USSR)

ABSTRACT: In the introduction, several papers dealing with this subject which have already been published (Refs 1-3) are dealt with, and the problem is discussed. The authors themselves investigated the following reactions:

a) $Zn^{68}(d,p)Zn^{69}$; b) $Ga^{69}(n,p)Zn^{69}$; c) $Ga^{71}(d,\alpha)Zn^{69}$.

Zn^{69} occurs as a β-active isotope with the half-life of 57 min., and it has an isomeric state which goes over into the ground state with a half-life of 13.8 h.

The ratio σ^*/σ ($=Zn^{69}$-yield in the isomeric state/Zn^{69}-yield in the ground state) was determined by the authors from the analysis of the decay curve (β-particles were counted by means of a G.M.counter).

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On the Ratio Between the Yields of the Isomeric and the Ground State of Zn^{69}, Produced in Various Nuclear Reactions

σ^*/σ of Zn^{69} was hitherto measured as 0.29 (capture of thermal neutrons by Zn^{68}, reference 1) and from the reaction $Ge^{72}(n,\alpha)Zn^{69}$ by using 14 Mev neutrons as being $\sigma^*/\sigma = 1.1$ (Ref 4). d-irradiation was carried out in the outer chamber of a cyclotron (E_d with an accuracy of up to 0.5 Mev), and n-irradiation on a neutron generator with a tritium target. The result obtained by the investigation of the reaction a) is shown by figure 1: Within the energy range of $2.5 \leq E_d \leq 9$ Mev, σ^*/σ increases slightly with increasing energy and remains constant at ~ 0.5. The reaction b) for $E_n = 14$ Mev results in $\sigma^*/\sigma = 1.4$, and reaction c) finally results in a value fluctuating by 0.5 within the error limits for deuteron energies between 4 and 8 Mev. The fact that Levkovskiy (Ref 4) found practically the double value for the reaction $Ge^{72}(n,\alpha)Zn^{69}$ (with E_n being equal) is finally discussed.- There are 2 figures and 4 references, 1 of which is Soviet.

SOV/56-35-6-5/44

On the Ratio Between the Yields of the Isomeric and the Ground State of Zn^{69}, Produced in Various Nuclear Reactions

ASSOCIATION: Radiyevyy institut Akademii nauk SSSR
(Radium Institute of the Academy of Sciences, USSR)

SUBMITTED: June 16, 1958

Card 3/3

FUNSHTEYN, D.

The amateur photographer and the newspaper. Sov. foto 17 no.4:25-26 Ap '57. (MLRA 10:6)

(Photography, Journalistic)

KUZNETSOV, N.A., otv.red.; VITKOVSKIY, A.P., red.; BOZHENKO, Ye.F., red.; GAVRILENKO, I.G., red.; GRINEK, V.S., red.; IGRUNOV, N.S., red.; KRUPA, G.D., red.; RAZDOBARKIN, V.I., red.; RYABOKOBYLENKO, V.I., red.; SEMENOV, M.K., red.; CHEFRANOV, B.N., red.; FUNSHTEYN, D.A., red.; PETROPOL'SKAYA, O.A., red.

[Belgorod Boiler-Making Factory] Belgorodskii kotlostroitel'nyi. Voronezh, TSentral'noe-Chernozemnoe knizhnoe izd-vo, 1964. 185 p. (MIRA 18:7)

1. Belgorodskiy Gosudarstvennyy kotlostroitel'nyy zavod. 2. Direktor Belgorodskogo Gosudarstvennogo kotlostroitel'nogo zavoda (for Chefranov). 3. Nachal'nik byuro tekhnicheskoy informatsii i izobretatel'stva Belgorodskogo Gosudarstvennogo kotlostroitel'nogo zavoda (for Gavrilenko). 4. Glavnyy konstruktor spetsial'nogo konstruktorskogo byuro energeticheskikh kotlov Belgorodskogo Gosudarstvennogo kotlostroitel'nogo zavoda (for Semenov). 5. Zamestitel' glavnogo inzhenera Belgorodskogo Gosudarstvennogo kotlostroitel'nogo zavoda (for Ryabokobylenko).

ROMANOV, Ye., inzh.; FUNSHTEYN, B., inzh.

PZP-3 movable grain loader. Muk.-elev.prom. 26 no.7:11 Jl '60. (MIRA 13:8)

1. Gosudarstvennyy institut Promzernoproyekt.
(Loading and unloading)

RAL'TSEVICH, V., inzh.; PAVLOV, V., inzh.; PYATENKOV, V., inzh.; FUNSHTEYN, E., inzh.

Mechanized placement of concrete into mobile molds of round silos. Muk.-elev. prom. 27 no.1:14-15 Ja '60. (MIRA 14:1)

1. Gosudarstvennyy institut Promzernoproyekt.
(Concrete construction) (Grain elevators)

SENCHENKOV, Aleksandr Filippovich; FUNSHTEYN, Lidiya Grigor'yevna; TARASOV, F.I., redaktor; LARIONOV, G.Ye., tekhnicheskiy redaktor

[The use of ferrite in radio apparatus] Primenenie ferritov v radioapparature. Moskva, Gos. energ. izd-vo 1956. 79 p. (Massovaia radiobiblioteka, no.250) (MLRA 10:2)
(FERRITE (STEEL CONSTITUENT))
(RADIO--APPARATUS AND SUPPLIES)

FunshTeun. L. G.

Funshteyn, L.V.

FUNSHTEYN, L.V., doktor meditsinskikh nauk

Priority of Russian science in the investigation of osseous lymphogranulomatosis. Trudy AMN SSSR 21 no.4:263-266 '52. (MLRA 10:8)

1. Iz patologoanatomicheskogo otdeleniya (zav. - prof. S.S.Vail') TSentral'nogo rentgenologicheskogo, radiologicheskogo i rakovogo instituta (dir. - zaslushennyy deyatel' nauki prof. M.I.Nemenov [deceased]) Ministerstva zdravookhraneniya SSSR.

(HODGIN'S DISEASE,
bone, hist. of research in Russia)
(BONES, neoplasms,
Hodgkin's dis., hist. of research in Russia)

FUNSHTEYN, L.V., doktor meditsinskikh nauk; POBEDINSKIY, M.N., professor, direktor.

Skeletal changes in chronic leucoses. Vest.rent.i rad. no.3:47-54 My-Je '53. (MLRA 6:8)

1. TSentral'nyy rentgenologicheskiy, radiologicheskiy i rakovoy institut Ministerstva zdravookhraneniya SSSR. (Leucosis)

FUNSHTEYN, L.V. (Leningrad)

Causes of death in lymphogranulomatosis. Arkh. pat. 16 no.3: 78-79 Jl-S '54. (MLRA 7:10)

1. Iz TSentral'nogo nauchno-issledovatel'skogo rentgeno- i radiologicheskogo instituta (dir. prof. M.N.Pobedinskiy) Ministerstva zdravookhraneniya SSSR.

(HODGKIN'S DISEASE,
death in, causes)
(DEATH,
causes in Hodgkin's dis.)

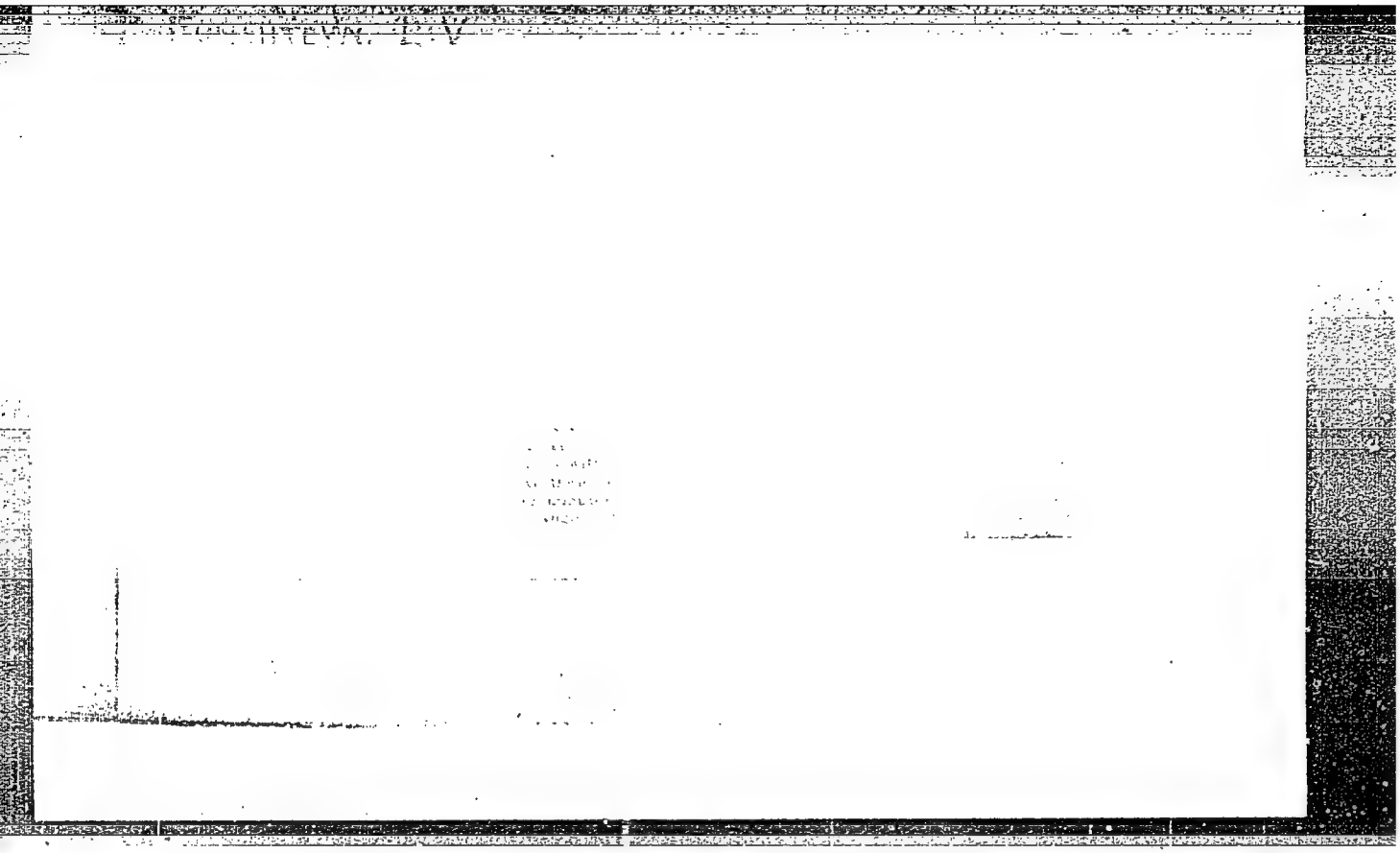
FUNSHTEYN, L.V.

Med

2

Pathologic picture of experimental rat sarcoma treated with the biological preparation P. S. E. Manoilov and L. V. Funshtein. *Voprosy Onkologii* 1; No. 5, 41-6(1955); cf preceding abstr.—Rats were injected with 9,10-dimethyl-1,2-benzanthracene for the production of induced rat sarcoma. Some of the rats were treated with prepn. P, other rats were left untreated as controls. Histopathologic studies of the sarcomas were made of the treated and control rats. The results of the microscopic study are presented. The prepn. may intensify the malignancy progress in some cases and arrest it in other instances, or the two influences may operate simultaneously. B. S. Levine

Cent. Sci. Res. Inst. Roentgeno-Radiology, Min. Health USSR



APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000513910008-4"

FUNSHTEYN, L. V.

"Pathomorphological Peculiarities of Acute Radiation Sickness," Voyenno-Medits. zhur., No.12, pp. 27-32, 1955

The article lists the differences between the symptoms evident in patients suffering from acute radiation sickness and the symptoms occurring with other diseases, explaining how these can be detected.

1080201

FUNSHTEYN, L.V.

Pseudophotographic effect occurring following the radiography of tissues. Zhur.nauch.i prikl. fot.i kin. 1 no.2:122-126 Mr-Ap '56. (MIRA 9:10)

1. TSentral'nyy nauchno-issledovatel'skiy rentgeno-radiologicheskiy institut Ministerstva zdravookhraneniya SSSR.
(Radiography)

FUNSHTEYN, L V.

"On Preserving the Proliferative Capacity of the Epithelium of Skin Subjected to the Local Action of Ionizing Radiation," by L. V. Funshteyn, Central Scientific Research Roentgeno-Radiological Institute, Ministry of Health USSR, Meditsinskaya Radiologiya, Vol 1, No 6, Nov/Dec 56, pp 31-35

The purpose of the investigation was to find a method for the elimination of the harmful local effect of ionizing radiation on the skin during external irradiation, using rabbits as experimental subjects.

The following forms of penetrating radiation were used: gamma radiation of radioactive cobalt; beta radiation of radioactive phosphorous and strontium; and X-radiation.

On subcutaneous injection of scarlet red following local X-, gamma-, or beta irradiation, and also on application of naphthalan oil or decomposed butter to the skin with preliminary beta irradiation, the surface epithelium and the epithelium of the follicles showed a high degree of proliferation, but the epithelium of the sebaceous glands was transformed into metaplastic squamous epithelium.

Sum. 1322

FUNSHTEYN, L.V.

The preservation of proliferative capacity in the irradiated epithelium and the possibility of preventing radiation injury to the epidermis by this method led the authors to set up experiments on locally irradiated skin in which proliferation of the epidermis had been induced beforehand. Under these conditions irradiation with doses from 1,000 to 2,000 r for beta irradiation and from 3,600 to 4,500 r for X- and gamma irradiation showed no effect on the character and the course of the proliferating epithelium. (U)

SUM. 1372

USSR/Human and Animal Physiology (Normal and Pathological). Skin. T-14

Abs Jour : Ref Zhur - Biol., No 11, 1958, 51417

Author : Funstoyn, L.V.
Inst : -
Title : Proliferation Capacity of the Skin Epithelium Following Local X-Ray Irradiation.

Orig Pub : Vestn. venerol. i dermatol., 1956, No 6, 19-25.

Abstract : Ears of rabbits were once irradiated by 1,722-3,600 r doses. In order to stimulate proliferation of the epithelium, scarlet red dye was injected into the skin of the ears (to one group of animals immediately after irradiation, to another group at various times after irradiation, and finally to some of the animals 7-8 days before irradiation). Histological investigations of irradiated skin showed that the above substance removes symptoms of radiation sickness in the epidermis, as well as

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FUNSHTEYN, L.V. (Leningrad)

Desquamation of the seminal epithelium of the testis in acute radiation sickness [with summary in English]. Arkh.pat. 19 no.9: 47-50 '57. (MIRA 10:12)

1. Iz TSentral'nogo nauchno-issledovatel'skogo rentgeno-radiologicheskogo instituta (dir. - prof. M.M.Pobedinskiy) Ministerstva zdravookhraneniya SSSR.

(ROENTGEN RAYS, effects,
on testicular seminal epithelium in animals (Rus))
(TESTES, effect of radiations,
x-rays, on seminal epithelium in animals (Rus))

FUNSHTEYN, L.V.; SHCHERBAN', E.I.

Histochemical study of iron in some internal organs during acute experimental radiation sickness. Vop.radiobiol. 2: 127-136 '57. (MIRA 12:6)

1. Sotrudniki TSentral'nogo nauchno-issledovatel'skogo rentgeno-radiologicheskogo instituta Ministerstva zdravookhraneniya SSSR.
(IRON IN THE BODY) (RADIATION SICKNESS)

LYKOVA, G.S.; FUNSHTEYN, L.V.

Autoradiography of organs of the endocrine system in irradiated animals. Vop.radiobiol. 2:281-289 '57. (MIRA 12:6)

1. Sotrudniki TSentral'nogo nauchno-issledovatel'skogo rentgeno-radiologicheskogo instituta Ministerstva zdravookhraneniya SSSR.
(AUTORADIOGRAPHY) (ENDOCRINE GLANDS) (RADIATION SICKNESS)

FUNSHTEYN, L.V.

Proliferative capacity of the epidermis following local irradiation with radioactive cobalt (Co^{60}). Vop.radiobiol. 2:313-322 '57. (MIRA 12:6)

1. Sotrudnik TSentral'nogo nauchno-issledovatel'skogo rentgeno-radiologicheskogo instituta Ministerstva zdravookhraneniya SSSR.
(SKIN) (COBALT--ISOTOPES)

FUNSHTEYN, L.V.

Experiment in treating local skin injuries produced by β-rays with a Naftalan petroleum extract. Vop.radiobiol. 2:445-454 '57. (MIRA 12:6)

1. Sotrudnik TSentral'nogo nauchno-issledovatel'skogo rentgeno-radiologicheskogo instituta Ministerstva zdravookhraneniya SSSR.
(PETROLEUM--THERAPEUTIC USE) (SKIN--WOUNDS AND INJURIES)
(RADIATION PROTECTION)

FUKSHTEYN, L.V., SIPOVSKIY, P.V.

Morphological aspects of death during or shortly after irradiation.
Med.rad 3 no.5:82-84 S-O '58 (MIRA 11:12)

1. Iz otdeleniya patologicheskoy morfologii TSentral'nogo nauchno-issledovatel'skogo rentgeno-radiologicheskogo instituta i kafedry patologicheskoy anatomii Gossudarstvennogo instituta dlya usovershenstvovaniya vrachey imeni S.M. Kirova.
(ROENTGEN RAYS, eff.
death during or shortly after irradiation, morphol.(Rus))

FUNSHTEYN, L.V.

"Studies in the pathological anatomy of radiation sickness" by N.A. Kraevskii. Reviewed by L.V. Funshtein. Med.rad. 3 no.6:69-70 N-D '58. (MIRA 12:1)

(RADIATION SICKNESS)
(ANATOMY, PATHOLOGICAL)
(KRAEVSKII, N.A.)

FUNSHTEYN, L.V.; BELUGINA, Z.T. (Leningrad)

Atypical manifestations of myeloid leukemia. Arkh.pat. 20 no.11:62-65 '58. (MIRA 12:8)

1. Iz TSentral'nogo nauchno-issledovatel'skogo rentgeno-radiologicheskogo instituta (dir. - prof.M.N.Pobedinskiy).
(LEUKEMIA) (MARROW--TUMORS)

SIPOVSKIY, P.V.; FUNSHTEYN, L.V. (Leningrad)

Significance of orthostatic circulatory disorders in the effect of total-body roentgen-irradiation in rabbits. Med. rad. 4 no.3:80-81 Mr '59. (MIRA 12:7)

(BLOOD CIRCULATION, physiol.
eff. of orthostatic hemodynamic disord. on rabbit reactions to total-body x-ray irradiation (Rus))
(ROENTGEN RAYS, EFFECTS,
same)

PRIVES, M.G. (Leningrad, P-101, ul. Voskova, d.15, kv.36); FUNSHTEYN, L.V.; SHCHERBAN', E.I.; SHISHOVA, V.G.

Significance of a method of labeled compounds for investigating the arterial system of the bone in vivo experiments. Arkh.anat.gist.i embr. 37 no.11:56-64 N '59. (MIRA 13:4)

1. Kafedra normal'noy anatomii (zaveduyushchiy - prof. M.G. Prives) 1-go Leningradskogo meditsinskogo instituta im. akademika I.P. Pavlova i laboratoriya patologicheskoy anatomii (zaveduyushchiy - prof. L.V. Funshteyn) TSentral'nogo rentgenologicheskogo i radiologicheskogo instituta.
(BONE AND BONES blood supply)

FUNSHTEYN, L.V.

State of the skin of white mice after total gamma irradiation with radioactive cobalt. Vest.derm.i ven. 33 no.6:42-46 N-D '59. (MIRA 13:12)

(SKIN) (GAMMA RAYS—PHYSIOLOGICAL EFFECT)

GRACHEVA, N.D.; LYKOVA, G.S.; ~~FUNSHTEYN, L.Y.;~~ SHCHERBAN', E.I.; POBEDINSKIY, M.N., prof., zasluzhennyy deyatel' nauki, red.

[Manual on histoautoradiography] Posobie po gistoavto-radiografii. Pod red. M.N.Pobedinskogo. Leningrad, TSentr. nauchno-issl.in-t med.radiologii, 1960. 49 p.
(MIRA 14:3)

(TISSUES--RADIOGRAPHY)

FUNSHTEYN, L. V

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PHASE I BOOK EXPLOITATION SOV/5435

Kiselev, P. N., Professor, G. A. Gusterin, and A. I. Strashinin, Eds.

Voprosy radiobiologii. t. III: Sbornik trudov, posvyashchennyy 60-letiyu so dnya rozhdeniya Professora M. N. Pobedinskogo (Problems in Radiation Biology. v. 3: A Collection of Works Dedicated to the Sixtieth Birthday of Professor M[ikhail] N[ikolayevich] Pobedinskiy [Doctor of Medicine]) Leningrad. Tsentr. n-issl. in-t med. radiologii M-va zdravookhraneniya SSSR, 1960. 422 p. 1,500 copies printed.

Tech. Ed.: P. S. Peleshuk.

PURPOSE: This collection of articles is intended for radiobiologists.

COVERAGE: The book contains 49 articles dealing with pathogenesis, prophylaxis, and therapy of radiation diseases. Individual articles describe investigations of the biological effects of radiation carried out by workers of the Central Scientific Research Institute for Medical Radiology of the Ministry of Public Health, USSR. [Tsentral'nyy nauchno-issledovatel'skiy institut meditsinskoy radiologii Ministerstva zdravookhraneniya SSSR] during 1958-59. The following

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topics are covered: various aspects of primary effects of radiation; the course of some metabolic processes in animals subjected to ionizing radiation; reactions in irradiated organisms; morphologic changes in radiation disease; and reparation and regeneration of tissues injured by irradiation. Some articles give attention to the effectiveness of experimental medical treatments. No personalities are mentioned. References accompany almost all of the articles.

TABLE OF CONTENTS: